

NON-PUBLIC?: N  
ACCESSION #: 8906200200  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Washington Nuclear Plant - Unit 2 PAGE: 1 of 6

DOCKET NUMBER: 05000397

TITLE: Engineered Safety Feature System Actuation Caused By Inadvertent Fuse Removal and Loss of Power Due to Inadequate Fuse Labeling/Inadequate Training/Personnel Error

EVENT DATE: 05/14/89 LER #: 89-016-00 REPORT DATE: 06/13/89

OPERATING MODE: 5 POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: J.D. Arbuckle, Compliance Engineer TELEPHONE: 509-377-2115

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On May 14, 1989 at 0912 hours, a Plant Reactor Operator inadvertently tripped the Division 1 and 2 offsite power supply feeders which caused a loss of power to safety related power Buses SM-7 (Division 1) and SM-4 (Division 3). The loss of power to bus SM-7 caused the Division 1 Diesel Generator to start and load bus SM-7. In addition, the loss of Division 1 power caused the loss of power to Reactor Protection System (RPS) Bus A which caused multiple Engineered Safety Feature (ESF) isolations and actuations. At the time of the event the plant was shutdown for the annual refueling and maintenance outage. Preventive maintenance was scheduled for Division 2 of the AC Distribution System (including safety related Bus SM-8) and it was inoperable prior to and during the event. The Backup Power Supply TR-B (which powers safety related buses SM-7 and SM-8) was de-energized and unavailable.

The cause of the event was the inadvertent removal of potential transformer fuses that sense TR-S (offsite startup) line voltage and provide trip and lockout signals to breakers S-1 and S-2 (through which buses SM-1 and SM-2 are

powered). As a result, off-site power was lost or unavailable to all safety related buses, and Diesel Generator 1 (DG-1) started and was relied upon to restore safety related bus SM-7 to power. The following systems were lost due to the loss of power: Residual Heat Removal (RHR) Shutdown Cooling, Plant Service Water (TSW), Fuel Pool Cooling (FPC), Tower Makeup Water (TMU), Control and Service Air (CAS) and Control Rod Drive (CRD). The loss of power to Bus SM-7 deenergized RPS Bus A causing an RPS half scram. The loss of RPS Bus A also causes an Outboard Nuclear Steam Supply Shutoff System (NSSSS) isolation of Groups 1 (Main Steam Line Drains only), 2, 5, 6, and 7. NSSSS Group 5 isolates RHR Shutdown Cooling. In addition, the loss of RPS A power causes some NSSSS Group 3 (Primary and Secondary Containment Ventilation and Purge Systems) and Group 4 (Miscellaneous Balance of Plant) isolations and actuations.

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Abstract (continued)

Plant operators restarted RPS-MG-1A and reset the RPS half scram. The operators restored power to Division 1 SM-7 through SM-1 by 0941 hours. The Division 3 (High Pressure Core Spray) bus SM-4 power was restored by 1002 hours. By 1017 hours RHR Shutdown Cooling, Plant Service Water and Control and Service Air were recovered and, at 1426 hours, Fuel Pool Cooling was restored. The TMU System was not restarted due to the planned SM-8 outage which de-energized the discharge valve for pump TMU-P-1A.

The root causes of this event are 1) inadequate labeling of Potential Transformer Cabinet doors, 2) infrequent training of Operations personnel on pulling PT fuses, and 3) personnel error in not following procedures. Corrective actions include 1) improving the labeling of the Potential Transformer cabinet doors, 2) providing training on pulling PT fuses, and 3) counselling the individual involved.

There is no safety significance associated with this event. The Division 1 Diesel Generator started and restored power to safety related bus SM-7 as designed, and RHR Shutdown Cooling was restored within the allowable Technical Specification time limit.

END OF ABSTRACT

Plant Conditions

- a) Power Level - 0%
- b) Plant Mode - 5 (Refueling)

Event Description

On May 14, 1989 at 0912 hours, a Plant Reactor Operator inadvertently tripped the Division 1 and 2 offsite power supply feeders which caused a loss of power to safety related power Buses SM-7 (Division 1) and SM-4 Division 3: High Pressure Core Spray (HPCS)!. The loss of power to bus SM-7 caused the Division 1 Diesel Generator to start and load bus SM-7. In addition, the loss of Division 1 power caused the loss of power to Reactor Protection System (RPS) Bus A which caused multiple Engineered Safety Feature (ESF) isolations and actuations.

At the time of the event the Plant was in operational condition 5 (Refueling) with the reactor head removed, the reactor cavity flooded up and the fuel pool gates removed. In addition, buses SM-7 and SM-4 were powered from the Startup Power Supply TR-S through buses SM-1 and SM-2 and breakers S1 and S2. The Division 2 bus SM-3 and associated safety related bus SM-8 were de-energized in maintenance. The Backup Power Supply TR-B (offsite power supply to safety related buses SM-7 and SM-8) was de-energized to prevent backfeed into the breakers scheduled for maintenance, and the Division 2 and 3 diesel generators were out of service for planned maintenance activities.

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The event occurred when the reactor operator implemented the last action on a Danger Tag Clearance Order which was described as "E-PT-SM3/1 Fuses (3) Auxiliary Cubicle". On examining the SM-3 Auxiliary Cubicle the reactor operator was confronted with two internal cabinets, one over the other, reading "Bus Potential Transformers" on the upper cabinet and "Line Potential Transformers" on the lower. The PT fuses are located inside the cabinet doors and opening the doors removes the associated PT fuses from the circuit. The designations "Bus" and "Line" Potential Transformers were the only labels in the cubicle. In an attempt to relate the Clearance Order EPN to the auxiliary cubicle labels, the operator consulted with other reactor operators and the Work Control Center Group for determining the appropriate equipment on the clearance order. The operator also reviewed the appropriate Electrical Wiring Diagram (EWD) to determine the correct fuses to be pulled. The operator felt that he had determined from the drawing that the two sets of fuses in the cubicle were in series and were the appropriate fuses to be pulled. He then removed the "Bus Potential Fuses" from the circuit. Although these were the correct fuses, he was expecting to see two fuses but found three and questioned which fuses should be pulled. During this process the operator failed to involve Operations supervision as required by procedure.

As a result of further review of the EWD and subsequent discussions with other individuals, the operator felt he had now identified the correct fuses. The operator then proceeded to the auxiliary cubicle and also pulled the "Line Potential Fuses," causing the loss of power to SM-1 and SM-2. This action was

beyond the scope of that provided in the Clearance Order.

The loss of power to Class 1E Bus SM-7 caused the Division 1 Diesel Generator to start and load Bus SM-7. The loss of power caused the following systems to be temporarily lost: RHR (Shutdown Cooling), Plant Service Water (TSW), Fuel Pool Cooling (FPC), Control Rod Drive (CRD), Tower Makeup Water (TMU) and Control and Service Air (CAS).

In addition, the loss of RPS A caused an Outboard Nuclear Steam Supply Shutoff System (NSSSS) isolation. The outboard isolations occurred for NSSSS Group 1 (Main Steam Line Drains only), Group 2 (Reactor Water Sample valves), Group 5 Residual Heat Removal (RHR) and Traversing In-Core Probe (TIP) Systems!, Group 6 (RHR Shutdown Cooling), and Group 7 (Reactor Water Cleanup System). In addition, loss of RPS A power causes some NSSSS Group 3 (Primary and Secondary Containment Ventilation and Purge System) and NSSSS Group 4 (Miscellaneous Balance of Plant) isolations and actuations. The Standby Gas Treatment (SGT) System also started on loss of power to RPS Bus A.

At the time of the event, RPS-Bus-B had previously been transferred to alternate power and was not affected by the event. In addition, the HPCS System had previously been isolated for maintenance.

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#### Immediate Corrective Action

Plant operators restarted RPS-MG-1A and reset the RPS half scram. By 0941 hours the "Line Potential Transformer" fuses had been reinserted and TR-S power returned to SM-7 with DG-1 in idle. SM-4 power was restored by 1002 hours. By 1017 hours RHR Shutdown Cooling had been returned to service as had the rest of the systems listed above, with the exception of Fuel Pool Cooling which was returned to service at 1426 hours. The TMU System was not restarted due to the planned SM-8 outage which de-energized the discharge valve for pump TKJ-P-1A.

#### Further Evaluation and Corrective Action

##### A. Further Evaluation

1. The starting of the Division 1 Diesel Generator and the Nuclear Steam Supply Shutoff System isolations and actuations are Engineered Safety Features and; therefore, this event is reportable per 10CFR50.73(a)(2)(iv).

2. Had the backup power supply bus TR-B been available, relay logic would have allowed Breaker B-7 to energize SM-7 and return power to the

RPS-MG-1A before the NSSSS isolation actuations occurred. Flywheel energy in the RPS-MG-1A would have carried it through the loss of power transient. In addition, Backup Power Supply TR-B would have re-powered SM-8 if it had been operable. The Division 2 and Division 3 Diesel Generators would have also started if they had been operable. There were no other structures, components, or systems inoperable prior to the event that contributed to the event.

3. The root causes of this event are as follows:

Inadequate labeling of the "Bus" and "Line" Potential Transformer cabinet doors. Had the appropriate Equipment Part Number (EPN) label been affixed to the cabinet doors, the operator would have been able to determine and pull the correct PT fuses.

Infrequent PT fuse training of Operations personnel. Pulling PT fuses is not frequently performed by operators and, as a result, training as to designation, significance, and orientation is normally not covered in refresher training.

Personnel error. The reactor operator failed to involve Operations supervision as required by procedure when it was determined that a potential problem existed. In addition, the operator expanded the scope of the Clearance Order without authorization to do so. The operator had pulled five fuses instead of three as designated by the Clearance Order. Plant procedures were not a cause of this event.

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#### B. Further Corrective Actions

1. SM-3 Auxiliary Cabinet and similar cabinet labeling will be improved to eliminate the possibility for inaccurate identification of Potential Transformer fuses.
2. The Operations department will provide training to operators as to designation, significance, and orientation of the "Line" and "Bus" Potential Transformers in the SM-3 Auxiliary Cabinet and similar cabinets.
3. The reactor operator involved was counselled on 1) the importance of informing Operations supervision when a problem is discovered during the clearance order process, and 2) the importance of following procedures.

4. This LER will be required reading for all Plant Operators (Licensed and Non-Licensed).

5. A double verification program for clearance order implementation is currently required prior to removal and reinstallation of fuses in the control room. The Operations department will evaluate expanding this program beyond the control room.

#### Safety Significance

There is no safety significance associated with this event. The Division 1 Diesel Generator started and repowered Bus SM-7 as designed. At the time of the event the reactor water level was greater than 22 feet above the reactor vessel flange which provides a large heat sink for core cooling and adequate time to restore RHR Shutdown Cooling. Residual Heat Removal Shutdown Cooling was restored within the allowable Technical Specification time limit. Additionally, no Plant condition requiring the ESF isolations and actuations existed and all ESF isolations and actuations occurred as designed. Accordingly, this event posed not threat to the health and safety of the public or Plant personnel.

#### Similar Events

88-021

#### EIIS Information

Text Reference EIIS Reference

#### System Component

Bus SM-7 (Div. 1) and SM-4 (Div. 3) EB SWGR  
Diesel Generator DG-1 EK DG  
Reactor Protection System (RPS) JC ---  
RPS-Bus-A JC BU  
Bus SM-8 (Div. 2) EB SWGR

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#### EIIS Information

Text Reference EIIS Reference

#### System Component

TR-B and TR-S EA XFMR

Breakers S-1 and S-2 EA BKR  
Bus SM-1 and SM-2 EB BU  
Residual Heat Removal (RHR) System (Shutdown Cooling) BD ---  
Plant Service Water (TSW) System KG ---  
Fuel Pool Cooling (FPC) System DA ---  
Tower Makeup Water (TMU) System KI ---  
Control and Service Air (CAS) System LD ---  
Control Rod Drive (CRD) System AA ---  
Nuclear Steam Supply Shutoff System (NSSSS) BD ---  
Primary and Secondary Containment and Purge Systems VH ---  
RPS-MG-1A JC MG  
TMU-P-1A KI P  
Diesel Generator DG-2 and DG-3 EK DG  
Fuses E-PT-SM3/1 EA FU  
Main Steam Line Drain Valves SN LOV  
Reactor Water Sample Valves AD ISV  
Traversing In-Core Probe (TIP) System IG ---  
Reactor Water Cleanup (RWCU) System CE ---  
Standby Gas Treatment (SGT) System BH ---  
RPS-Bus-B JC BU  
High Pressure Core Spray (HPCS) System BG ---

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 3000 George Washington Way Richland, Washington 99352

Docket No. 50-397

June 13, 1989

Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: NUCLEAR PLANT NO. 2  
LICENSEE EVENT REPORT NO. 89-016

Dear Sir:

Transmitted herewith is Licensee Event Report No. 89-016 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Very truly yours,

J.W. Baker  
C.M. Powers (M/D 927M)  
WNP-2 Plant Manager

cmp:lg

Enclosure:  
Licensee Event Report No. 89-016

cc: Mr. John B. Martin, NRC - Region V  
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